

Imaging Science Seminar

Single-Molecule Probes and Computational Optics for Imaging Nanoscale Biological Structures

Matthew D. Lew

Electrical and Systems Engineering

Washington University in St. Louis

Abstract: Super-resolved fluorescence microscopy, the development of which was awarded the Nobel Prize in Chemistry 2014, leverages the switchable states of fluorescent molecules to overcome the resolution limit of optical microscopes (roughly 250nm for visible light). Its exquisite resolution, single-molecule sensitivity, genetic specificity, and compatibility with living cells make it a compelling technology for imaging nanoscale dynamics within cells. In this talk, I will give an overview of how active control of fluorescent emission enables super-resolution, as well as how fluorescent molecules can be utilized as probes of their local environment. I will also discuss how computational optics can enable microscopes to visualize *how molecules work*, beyond just *where they are*, in biological samples. My lab has built a single-molecule nanoscope capable of simultaneously measuring the position and orientation of fluorescent molecules with nanoscale resolution within living cells.

Time: 8:40-9:30 a.m.
Date: Friday, September 8, 2017
Room: 0120 Green Hall